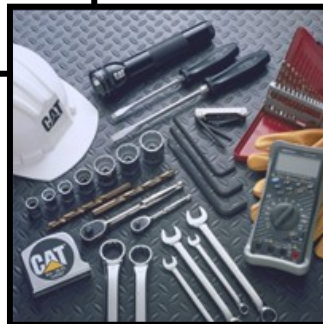
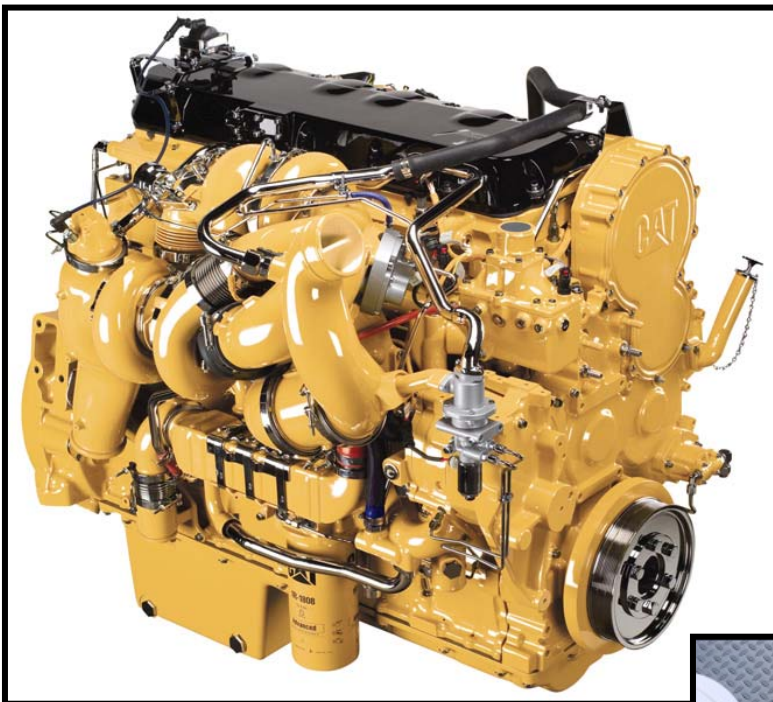


# On-Highway Truck Engine Training Catalogue January – July

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# 2010



# **FINNING (CANADA) TRUCK ENGINE TECHNICAL TRAINING PROGRAM**

The Authorized Truck Engine Parts and Service (TEPS) network is demanding improved access and availability to our training courses. As your partner in business, we have audited our process and review how we can best meet your needs. Our findings are that dealers with most up-to-date training have been doing the best in the areas that we measure performance. It is our contractual obligation to provide you with the best opportunity to train technicians for Caterpillar certification. At this time, we provide a structured course curriculum that when completed, should allow the technician to efficiently diagnose and repair Caterpillar on-highway truck engines. Each course builds upon the experience, skills and techniques learned in the previous course. We intend to improve this process by following our Vision Statement:

*Provide unparalleled World Class  
Power Systems Training and Technical support to our customers!  
Support our Customers, allowing them to become the best!*

## **History:**

Rapidly changing technology increases the demands on your technicians. We have listened to our partners and modified our training processes. Historically we require a technician to attend all our courses, but in particular order to become a certified technician. We currently have a prerequisite policy for our progressive manner. This policy has proven successful in meeting the goals it was set up to achieve.

## **Progress:**

For 2010, our plan is to move forward with our vision statement. Here is how we are going to proceed:

We have produced a 6 month schedule to allow you the most opportunities to maintain your Caterpillar requirements.

We are introducing a new course. The 3400E Over-haul course is designed to teach technicians that are familiar with Diesel engines, proper over haul practices and special procedures with regards to the Caterpillar 3400E series engine. This course will focus on key components and areas of the engine itself. This is not a mandatory course but is highly recommended.

## **Reminder:**

Please note, as of January 1<sup>st</sup>, 2009 each dealer must have one certified technician complete the AFA (Applied Failure Analysis) course.

## **PREREQUISITES FOR THE CORE COURSES**

It is necessary for a dealer to take Caterpillar Certified courses in a particular order because, the courses have been designed to build upon the skills learned in each previous course and it is the most cost efficient way for a technician to progress through the training program. Regardless of your technician's experience, with new technology being introduced, these courses are valuable as well as required by the dealership to remain a Certified Caterpillar Dealer.

### **On-Highway Engine Electronics (OHEE) 3 days**

We start with the On-Highway Engine Electronics. This course introduces your technician and fine tunes their skills for efficient use of programs such as Electronic Technician and Win Flash. These are the programs used to diagnose electronic problems and also for re-rating engine horsepower. After practical application of the program, the students are given an opportunity to access the <https://truck.cat.com> web site. This is the portal that Caterpillar uses to get all technical information and factory passwords to the dealer. This will lessen your customers down time because your technician can now get passwords (24-7) without contacting the Finning Technical Communicator. Technicians are required to have CWS login prior to attending this course.

### **Electronic Engine Controls (EEC) 3 days**

Through this course we will explain the operation, testing and troubleshooting procedure for all pressure position, speeds and temperature sensors for the following engines: 3406E, 3126E and C7 through C16. During this course the use of test ECM's and proper rerating procedures will be demonstrated. Introduction to component based trouble shooting. Harness repairs and connector installations. Use of paper schematics and navigation of online schematics will be explained and explored. Discuss Parameter settings and use of dedicated PTO.

### **HEUI/CCR Systems (HEUI/CCR) 3 days**

The third course in the Caterpillar Certification program is the HEUI/CCR systems. This course builds upon the first two courses, in that it adds to your technician's ability to troubleshoot Caterpillar medium duty engines. The HEUI/CCR system operation and testing will be demonstrated with the student participating in practical application of the mechanical and electronic troubleshooting procedures. The addition of the new 2007 medium duty engine line, including the common rail fuel and emissions systems will also be discussed.

### **ACERT™ Systems 4 days**

The fourth course in the series will cover the new technology introduced by Caterpillar called "ACERT™". The systems will be explained as well as special testing and adjusting of these new systems. This course will go into depth on 2007 emission systems including CGI, CRS, and DPF's. The proper use of warranty reports, data logging and submission to Cat along with researching SIMSI data from previous history will be practiced.

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HEUI/CCR Systems and ACERT™ Systems may be taken in any order but both must be taken before proceeding to EETS.

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### **Electronic Engine Troubleshooting (EETS) 4 days**

It is recommended that a technician be given at least one year of practical application of skills learned in the first four courses before attending this final course required for dealer certification. Technicians attending this course should come prepared to troubleshoot mechanical and electronic problems on a variety of engines, which may include 3126, 3406E, C-12, C-15 and C15 ACERT™. Diagnosing problems related to computer programs, communication devices, accessing Technical Marketing Information, retrieving factory passwords along with in-depth electronic and system troubleshooting.

As can be seen by the progression of these courses, it is in the dealer's best interest to send only technicians who will be responsible for troubleshooting problems on Caterpillar engines.

### **Applied Failure Analysis (AFA) 5 Days**

This course is intended for those who will be asked to form an opinion as to the root cause of failed engine components. Management of metallurgy, material and process laws, wear, and fracture characteristics are the fundamental principles behind this course. Course material includes: CAT Applied Failure Analysis books on all engine components, visual examination, basic metallurgy, principles of wear and fractures. Practical application is applied to all engine components.

\*\*\* As of January 1<sup>st</sup>, 2009 it is mandatory that one Technician from each TEPS dealer complete this course\*\*\*

### **Truck Engine Recertification and UPDATE (TER) 3 Days**

This course is designed to update the certified Caterpillar technician who has not attended an EETS course since 2007. The latest and greatest technology will be discussed along with verifying technician's skills in Caterpillar systems (Truck.Cat.Com, SIS, TMI and ET).

\*\*\* As of 2008 this is a mandatory requirement to retain certification. \*\*\*

**Note:** This class can also be taken by technicians requiring training upgrading on current products.

### **3400E Over-haul Course**

This Course is designed to teach technicians that are familiar with Diesel engines, proper over haul practices and special procedures with regards to the Caterpillar 3400E series engine. This course will focus on key components and areas of the engine itself.

# CATERPILLAR TECHNICAL TRAINING FLOW CHART

11/25/2008

## Diesel Engine Fundamentals

Optional introduction to Caterpillar Engines, utilizing the mechanical fuel systems. Offered on-demand only.

### On Highway Engine Electronics

1.

All technicians must have a current OHEE course or equivalent before proceeding

### Electronic Engine Controls

2.

All technicians must have a current EEC course or past equivalent before proceeding. Such as previous EEC or the 2002/2003 OHEE

### ACERT

### HEUI / CCR

3.

All technicians must have a HEUI course and ACERT course before attending EETS

### Electronic Engine Trouble Shooting

4.

Final course for certification. Usually after 1 yr experience after the HEUI course.

### Applied Failure Analysis

5.

A Premium course that teaches the attendee to find the root cause of failures, focused on engine related parts. Excellent for service and warranty personnel and the skills learned may be applied to any failure.

### Truck Engine Recertification and UPDATE

6.

Recertification course for those who completed EETS in 2007 and /or UPDATING for those requiring New Product training.

**Schedule:**

On the following pages you will see the initial offerings for the 2010 season. This schedule is subject to change due to course demand. For example, if we get a large demand for Applied Failure Analysis, we will be switching a class or adding more training dates to accommodate the demand. We have a minimum class size of four technicians. **Be sure to register your technician as soon as possible.**

**Cancellation Policy:**

Cancellations made without ten business days notice before the start of the course will still be invoiced to the dealer. We make every attempt to confirm registration in a course upon receipt of enrollment and one month prior to the course by email or fax. It is the dealer's responsibility to make the technician available for the course they are enrolled in.

**We want your feedback:**

As Partners in Business, we ask for your feedback. This is a major but effective change that improves our ability to meet your needs in the future. We want the technicians to give accurate course evaluations at all times. We need to know if you need training that we are not providing. If we can determine a course is feasible, we will do our best to provide it.

***Our training locations for TEPS training are Surrey, Calgary and Edmonton.***

A Technician Hire form is included in this catalogue. This form should be completed when you hire a technician from another dealership, or have a technician that you plan on sending through the program. This will better enable us to maintain an accurate and up-to-date data base of your training history.

## 2010 Course Schedule January – June

### Edmonton, Calgary

#### Edmonton

Date	Course	Length (Days)
<b>March</b>		
March 9 - 11	OHEE	3
March 16 – 18	EEC	3

#### Calgary

Date	Course	Length (Days)
<b>January</b>		
January 12 – 15	ACERT	4
<b>February</b>		
February 9 – 11	HEUI/CCR	3
February 23 – 26	3400E Over Haul	4
<b>March</b>		
March 22 – 26	AFA	5
<b>April</b>		
April 6 – 8	TER	3
<b>May</b>		
May 11 – 14	3400E Overhaul	4
<b>June</b>		
June 1 – 3	OHEE	3
June 15 – 18	ACERT	4

#### Legend

Course	
OHEE	On- Highway Engine Electronics
EEC	Electronic Engine Controls
HEUI	HEUI/CCR
ACERT	ACERT
EETS	Electronic Engine Troubleshooting
AFA	Applied Failure Analysis
TER	Truck Engine Recertification



## 2010 Course Schedule - Cont. January – June

### Surrey

#### Surrey

Date	Course	Length(Days)
<b>February</b>		
February 15 – 19	AFA	5
February 23 – 25	OHEE	3
<b>March</b>		
March 9 – 11	EEC	3
March 29 – 31	HEUI	3
<b>April</b>		
April 13 – 16	ACERT	4
	TER	3
<b>May</b>		
May 4 – 7	EETS	4
May 26 – 28	TER	3
<b>June</b>		
June 14 – 18	AFA	5

#### Legend

Course	
OHEE	On- Highway Engine Electronics
EEC	Electronic Engine Controls
HEUI	HEUI/CCR
ACERT	ACERT
EETS	Electronic Engine Troubleshooting
AFA	Applied Failure Analysis
TER	Truck Engine Recertification

# Student Enrollment

Company Name:		Dealer Code:	
Street Address:		Billing Address if different than Street Address:	
City:	Province:	Postal Code:	
Contact Name:	Phone #:	Fax #:	

Course Name:	Course Date:
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Student Name #1:	For AFA Binder Requested	YES
Student Name #2:	For AFA Binder Requested	YES
Student Name #3:	For AFA Binder Requested	YES
Student Name #4:	For AFA Binder Requested:	YES

**Hotel Reservations:**

Upon receipt of the enrollment form, reservations should be made in the name of the student at a hotel where all students for that class will be housed. This will simplify group study assignments and transportation requirements to and from classes and activities. The cost of accommodation is available at a reduced rate and is the responsibility of the company or student attending.

**Confirmation:**

When enrollment is accepted, confirmation letters will be sent out to the student and contact listed. The letter will include the preferred hotel selection and a list of any items the student is required to bring to class.

**Cancellation Policy:**

Dependant upon circumstances, companies will be billed for the full course cost if cancellation is not received ten business days prior to the course start date.

**Course Cost:**

All courses will be charged at a rate of \$330.00/student/day + GST, with the exception of Applied Failure Analysis (call for pricing)

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**Note:** I have reviewed the course description and agree that the person(s) listed above meet all qualified and are adequately prepared to attend this course. I have also read and agree to the terms and conditions of enrollment, as mentioned above.

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Approved By (Mgr.)	Date
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Method of Payment:

☐ Purchase Order #

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**Mail or Email Registration to:**

Sasha Ames  
Finning (Canada)  
6735 11 Street N.E.

Phone: (403) 516-2805  
email: [sames@finning.ca](mailto:sames@finning.ca)

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6735 11 Street N.E.

Phone: (403) 516-2805  
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## **Technician Hire**

Company Name:		Dealer Code:
Street Address:		
City:	Province:	Postal Code:
Contact Name:	Phone #:	Fax #:

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Technician Name:	Previous Dealer Code:
Technician Name:	Previous Dealer Code:
Technician Name:	Previous Dealer Code:
Technician Name:	Previous Dealer Code:

This form is to be completed when hiring a technician from another dealership, or hiring a technician that will be completing the TEPS Training program.

**By completing this form, this will enable us to maintain an accurate and up-to-date database.**

\_\_\_\_\_  
Approved By (Mgr.)

\_\_\_\_\_  
Date:

Mail or Email Form to:

Sasha Ames  
Finning (Canada)  
6735 11 Street N.E.  
Calgary, AB  
T2E 7H9

Phone: (403) 516-2805  
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Date:

Mail or Email Form to:

Sasha Ames  
Finning (Canada)  
6735 11 Street N.E.  
Calgary, AB  
T2E 7H9

Phone: (403) 516-2805  
Fax: (403) 516-2828  
email: [sames@finning.ca](mailto:sames@finning.ca)



**Course Title:** On-Highway Engine Electronics

**Duration:** 3 Days

**Course Attendance  
Maximum** 8 Students

**Course Cost** \$990.00/student + GST

**Course Description:**

This course is the first level course and is the prerequisite course for all other Caterpillar Certified courses at Finning (Canada). This course will explain the operation of the computer as a service tool. All functions of Electronic Technician program will be explained and reprogramming of parameters will be demonstrated. Reconfiguration of Electronic Control Modules will be done, including obtaining passwords from the Caterpillar Truck website. Students will work with Service Information System (SIS Web).

**Prerequisites:** Journeyman certification

**Course Objectives:**

Upon completion of this course, the participant will have had theoretical and/or practical exposure to the following:

- Basic Computer Operations:
- Create folders
- Transfer files between drives
- Retrieve files from CD
- Compressing files

**Use of CAT Communication Devices**

- 7X1700 Communication Adapter
- 171-4400 Communication Device
- Data links

## **Course Objectives Con't:**

### **Using Electronic Technician to:**

- Become familiar with each drop down menu
- Program parameters
- Replace an Electronic Control Module
- Re-rating engine horsepower
- Retrieve and print information

### **Using Service Information Systems to:**

- Locate Service Manual information, such as parts and specifications
- Locate wiring schematics

### **Use CAT On Line Web Site to:**

- Retrieve passwords
- Find Technical Marketing Information

### **Identify and Explain the Function of the Following Electronic Components:**

- Electronic Control Module
- Personality Module
- Test ECM mode

### **Review of the Latest CAT Information from:**

- TECH Tips

***Successful completion of a written examination with a passing grade of 80% is required to proceed to the following course.***

**Course Title:**                **Electronic Engine Controls**

**Duration:**                    3 Days

**Course Attendance  
Maximum**                8 Students

**Course Cost**                \$990.00/student + GST

**Course Description:**

This course will teach the Cat electronic engine component locations, functions and adjustments. Knowledge of system operation will be related to basic troubleshooting techniques of electronic faults and operational complaints of current electronic engines.

**Prerequisites:**                On-Highway Engine Electronics (2006)

**Course Objectives:**

After completion, the participant will be able to:  
Review of On-Highway Engine Electronics.  
Identify and use Cat information systems.

**Identify and explain the function of the following electronic components:**

- Electronic Unit Injectors
- Electronic Control Module (ECM)
- Personality Module Software
- All Cat position, Speed, temperature and pressure sensors
- Wiring harness, connectors and repairs
- Data links and protocols

**Calibrate and/or adjust the following electronic engine components:**

- Engine speed/timing sensors
- Fuel injector codes
- Injector trim files

**Demonstrate the following basics of electronic troubleshooting and repairs:**

- ECM replacement
- Use of wiring schematics and the Electronic Troubleshooting Manual.
- Operational complaints based on:
  - o Application specing, gearing parameters and recommendations
  - o Program customer parameters

**Explain the function and use of:**

- Trip data and histograms to decipher low power and fuel economy complaints
- Diagnostic codes
- Dedicated PTO applications and installation

***Successful completion of a written or online examination with a passing grade of 80% is required to proceed to the next course.***

**Course Title:** HEUI/CCR Systems

**Duration:** 3 Days

**Course Attendance  
Maximum** 8 Students

**Course Cost** \$990.00/student + GST

**Course Description:**

This course is intended for those technicians who will be responsible for the general troubleshooting and repair of Caterpillar electronic engines. On-Highway Engine Electronics (OHEE) and Electronic Engine Controls (EEC) are required before enrolling in this course.

This course will teach the Cat HEUI/CCR medium duty engine component locations, functions and adjustments. Knowledge of system operation will be related to basic troubleshooting techniques of electronic faults and operational complaints of current medium duty engines.

**Prerequisites:** OHEE and EEC

**Course Objectives:**

After completion the participant will be able to:

- Describe the components and operation of the medium duty engines.
- Explain the operation of the different components of the HEUI fuel systems.
- Explain the operation of the different components of the CCR fuel systems.
- Troubleshoot electronic, hydraulic and mechanical problems on a HEUI/CCR engine, using Electronic Technician, Service Information Systems and the HEUI/CCR fuel system fuel groups.
- Describe the new components and operation of the C7 and C9 Truck engines.
- Installation and programming of a dedicated PTO system.

***Successful completion of a written or online examination with a passing grade of 80% is required to proceed to the next course.***

**Course Title:** ACERT™ Systems

**Duration:** 4 Days

**Course Attendance  
Maximum** 8 Students

**Course Cost** \$1320.00/student + GST

**Course Description:**

This course is intended for those technicians who will be responsible for the general troubleshooting and repair of Caterpillar electronic engines. On-Highway Engine Electronics (OHEE) and Electronic Engine Controls (EEC) are required before enrolling in this course.

This course will teach the Cat ACERT™ engine component locations, functions and adjustments. Knowledge of system operation will be related to basic troubleshooting techniques of electronic faults and operational complaints of current electronic engines.

**Prerequisites:** OHEE and EEC

**Course Objectives:**

After completion the participant will be able to:

- Describe the different components of the ACERT™ C11, C13 and C15 engines
- Explain the operation of the different components for the ACERT™ Fuel system
- Troubleshoot electronic and mechanical problems on an ACERT™ engine, using Electronic Technician, Service Information Systems
- Perform critical adjustments on ACERT™ engines
- Discuss changes made to engines to meet the new 2007 emission standards

***Successful completion of a written or online examination with a passing grade of 80% is required to proceed to the next course.***

**Course Title:**                    **Electronic Engine Troubleshooting**

**Duration:**                        4 Days

**Course Attendance  
Maximum**                        6 Students

**Course Cost**                    \$1320.00/student + GST

**Course Description:**

This Course is designed to teach technicians that are familiar overhauling Diesel engines, proper over haul practices and special procedures with regards to the Caterpillar 3400E series engine. This course will focus on key components and areas of the engine itself.

**Prerequisites:**                    OHEE, EEC, HEUI/CCR and ACERT courses

**Course Objectives:**

After completion, the participant will be able to:

- Explain in writing the engine diagnostic procedures as per the CAT manuals provided
- Explain the procedures to establish and program customer specified parameters using CAT Electronic Technician
- Demonstrate flash downloading of the ECM
- Save, upload and print copy's of warranty downloads
- Use of Service Information Systems
- Completion of online Heavy- Duty Service Technician Certification modules

***Successful completion of a written or online examination with a passing grade of 80% is required to proceed to the next course.***

**Course Title:** Truck Engine Recertification and UPDATE

**Duration:** 3 Days

**Course Attendance  
Maximum** 6 Students

**Course Cost** \$990.00/student + GST

**Course Description:**

- This course will cover the latest changes in the Caterpillar On highway truck engines as well as Caterpillar websites. Students will complete the online Heavy- Duty Service Technician Certification modules as well as demonstrate effective troubleshooting techniques as per Caterpillar guidelines.

**Prerequisites:** 2007 or Older EETS Course

**Course Objectives:**

Upon completion of this course, the participant will have had theoretical exposure to the following:

- Review the latest changes to the Caterpillar websites
- Review and identify new engine systems
- Discuss the operation of the new systems.
- Understand how to troubleshoot the various systems.
- Demonstrate proper use of ET for setup and diagnostic code analysis.
- Complete the online Heavy- Duty Service Technician Certification modules

***Successful completion of a written or online examination with a passing grade of 80% is required.***

**Course Title:** Applied Failure Analysis

**Duration:** 5 Days

**Course Attendance  
Maximum** 12 Students

**Course Cost** 1650.00/student + GST

**Course Description:**

This course is intended for those who will be asked to form an opinion as to the root cause of failed engine components. Management of metallurgy, material and process laws, wear, and fracture characteristics are the fundamental principles behind this course. Course material includes: CAT Applied Failure Analysis books on all engine components, visual examination, basic metallurgy, principles of wear and fractures. Practical application is applied to all engine components.

**Prerequisites:** Dealer Employee

**Course Objectives:**

After completion of this course, participants will be able to:

**Use proper visual examination skills to:**

- Give an opinion as to the “root” cause of a failure
- Recognize various types of flaws and their cause in: Fasteners, connecting rods, crankshafts, engine bearings, pistons, rings, wrist pins, bushings, valves and turbochargers
- Increase customer satisfaction by using skills in “failure cause” explanations

***Successful completion of a written or online examination with a passing grade of 80%***



**Course Title:** Diesel Engine Fundamentals (Mobile Equipment)

**Duration:** 5 Days

**Course Attendance  
Maximum** 8 Students

**Course Cost** Call for pricing

**Course Description:**

Intended for Journeyman Mechanics and Apprentices who have joined the company and require updating or indoctrination to CAT terminology.

**Prerequisites:** Journeyman certification or Heavy Equipment Apprentice

**Course Objectives:**

After completion, the participant will be able to:

- Explain the operation and purpose of turbochargers, testing for intake, and exhaust systems
- Lubrication and cooling system recommendations, component operation, and crankcase blow by pressure
- Fuel system component operation and function of the 3406B and 1.1 litre engines. Basic governor operation and use of the fuel setting information to plot timing curve graphs and use of timing indicator group
- On engine fuel ration adjustments, dynamic fuel timing test, dynamic set point, and fuel settings on a running engine
- Static adjustments of 3116, 3126 MUI fuel system synchronization fuel setting, and timing
- Scrutinize exhaust smoke to determine cause of blue, black or white smoke conditions

***Successful completion of a written or online examination with a passing grade of 80%***

**Course Title:** 3400E Over-haul Course

**Duration:** 4Days

**Course Attendance  
Maximum** 6 Students

**Course Cost** \$1320.00/student + GST

**Course Description:**

This Course is designed to teach technicians that are familiar with Diesel engines, proper over haul practices and special procedures with regards to the Caterpillar 3400E series engine. This course will focus on key components and areas of the engine itself.

**Prerequisites:** On-Highway Engine Electronics

**Course Objectives:**

Upon completion of this course, the participant will have had theoretical exposure to the following:

- To learn what information is required to properly filling out OPT Overhaul Certification Sheets.
- Be able to look up proper Flash-File and Fuel number (FLS/FTS) information.
- Be able to Look up re-rate history of an engine and determine what parts would be required for Horsepower changes.
- Learn proper teardown techniques.
- Learn proper block cleaning, inspection and repair techniques.
- Use reusability guidelines to determine if parts are acceptable for reuse.
- Learn how to measure spacer plate and liner projection heights.
- Learn how to counter bore engine block for proper liner projection.
- Learn proper Head bolt thread repairs in the block.
- Learn how to Inspect and overhaul compression brakes.
- Learn how to adjust and calibrate cam timing.
- Learn proper valve, Injector, compression brake setting techniques.

***Successful completion of a written or online examination with a passing grade of 80% is required.***

# WHO TO CALL AT FINNING

## TECHNICAL TRAINING

### Administration

Sasha Ames: (403) 516-2805  
Email: [sames@finning.ca](mailto:sames@finning.ca)

Call for:

- All technical training requests
- Course registrations
- Course requests
- Waiting list enquiries

### Instructors:

#### Calgary:

Scott Coonfer: (403) 516-2818  
Email: [scoonfer@finning.ca](mailto:scoonfer@finning.ca)

Dave Dunlop: (403) 295-5734  
Email: [ddunlop@finning.ca](mailto:ddunlop@finning.ca)

#### Surrey:

Brad Holcik: (604) 882-2662  
Email: [bholcik@finning.ca](mailto:bholcik@finning.ca)

## TEPS ADMINISTRATION:

### TEPS Program Administrator:

Jennifer De Torres (604) 882-2431  
or (604) 888-3406  
Email: [jdetorres@finning.ca](mailto:jdetorres@finning.ca)

Call for:

- General Inquiries
- CAT IMAP Login ID's
- Factory Password Access (Must have Service Manager's Approval)
- Access to DLMS – Caterpillar On-Highway Engine Campus (on-line training)

## WARRANTY SUPERVISOR

Dennis Parsons (604) 882-2434

## INDUSTRY MARKETING MANAGER

Harold Denefeld (604) 888-3406

Harold Denefeld has overall responsibility for the On-highway truck engine business in Finning (Canada)